

a sensor module within the housing, the sensor module including a plurality of sensor packages, each sensor package having an axis of sensitivity positioned in a different spatial direction; and a control circuit within the package and coupled to the housing for controlling the sensor module.

10. The apparatus of claim 9, wherein the sensor module comprises at least one micro-machined accelerometer.

11. The apparatus of claim 9, wherein the sensor module comprises three micro-machined accelerometers positioned such that the axes of sensitivity are substantially orthogonal to each other.

12. The apparatus of claim 9, wherein the control circuit is an application specific integrated circuit.

13. The apparatus of claim 9, wherein the sensor module is a monolithic package selected from a group consisting of i) a hollow frame; ii) a box; iii) a three-dimensional circuit board; iv) a cylinder; and v) a cube.

14. The apparatus of claim 9 wherein the sensor packages include a sensor coupled to the sensor package.

15. The sensor module of claim 9, wherein the housing includes:
a cavity for receiving a sensor;
one or more parallel planar surfaces;
a bottom surface of the cavity;

5 a bottom exterior surface;
6 a top exterior surface; and
7 one or more side surfaces.

1 16. The sensor module of claim 15 wherein the housing includes:
2 one or more bond pads on one or more of the parallel planar surfaces;
3 one or more bond pads on the bottom exterior surface;
4 one or more bond pads on the top exterior surface; and
5 one or more bond pads on one or more of the side surfaces.

1 17. The sensor module of claim 15, wherein the housing cavity further includes
2 one or more resilient couplings for resiliently coupling the sensor to the
3 package, and
4 wherein the cross sectional shape of the resilient couplings is selected from a
5 group consisting of i) approximately rectangular, and ii) approximately circular.

1 18. The sensor module of claim 17, wherein the resilient couplings further include
2 one or more bumpers for slidingly supporting the sensor.

1 19. The sensor module of claim 17, wherein the housing cavity includes a bottom
2 surface, and wherein the resilient couplings are coupled to the bottom surface
3 of the cavity.

1 20. The sensor module of claim 19 wherein the resilient couplings are
2 approximately positioned at one or more ends of the bottom surface of the
3 cavity of the housing.

1 21. The sensor module of claim 19, wherein the resilient couplings are
2 approximately positioned at the approximate center of the bottom surface of
3 the cavity of the housing.

1 22. The sensor module of claim 17, wherein the housing cavity includes a bottom
2 surface, and wherein the bottom surface of the cavity further includes a
3 recess in the bottom surface of the cavity for receiving the resilient couplings.

1 23. The sensor module of claim 22, wherein the resilient couplings are
2 approximately positioned at the approximate center of the recess of the
3 bottom surface of the cavity.

1 24. The sensor module of claim 15, wherein the cavity of the housing further
2 includes a bottom surface, wherein one or more bumpers are coupled to the
3 bottom surface of the cavity for slidingly supporting the sensor in the housing.

1 25. The sensor module of claim 24, wherein the bumpers include a cross-
2 sectional shape selected from a group consisting of i) approximately square,
3 approximately rectangular, ii) approximately circular, and iii) approximately
4 triangular.

1 26. The sensor module of claim 15 wherein the sensor includes one or more bond
2 pads for coupling the sensor to the housing.

1 27. The sensor module of claim 26, wherein the bond pads cross sectional shape
2 is selected from a group consisting of i) approximately rectangular, ii)
3 approximately circular, iii) approximately oval, iv) approximately tri-oval, v)

4 approximately oct-oval, vi) approximately wavy sided rectangular, vii)
5 approximately oct-pie-wedge, viii) approximately hollow oct-pie-wedge, ix)
6 approximately nine circular, x) approximately starburst, and xi) approximately
7 sunburst.



1 28. The sensor module of claim 15, wherein the sensor further includes one or
2 more passive regions at one or more ends of the sensor, wherein the sensor
3 further includes one or more bond pads, and wherein the bond pads may be
4 located at one or more ends in the passive regions.

1 29. The sensor module of claim 12, wherein the sensor further includes one or
2 more active regions, wherein the sensor further includes one or more bond
3 pads, and wherein the bond pads may be located in the approximate center of
4 the active regions.

1 30. The sensor module of claim 15, wherein the housing further includes one or
2 more wire bonds;
3 wherein the sensor further includes one or more parallel planar surfaces;
4 wherein the housing further includes one or more parallel planar surfaces; and
5 wherein the wire bonds electrically couple the parallel planar surfaces of the
6 sensor to the parallel planar surfaces of the housing.

1 31. The sensor module of claim 12, wherein the sensor further includes a
2 mounting member for removably coupling the sensor to the housing.

1 32. The sensor module of claim 31, wherein the mounting member is a shorting
2 clip.

1 33. The sensor module of claim 31, further including a spring assembly for
2 removably coupling the mounting member to the housing.

1 34. The sensor module of claim 9, wherein the control circuit comprises;
2 a controller;
3 an adhesive for coupling the controller to the housing;
4 one or more wire bonds for coupling the controller to the housing; and
5 an encapsulant for encapsulating the controller and wire bonds.

1 35. The sensor module of claim 34, wherein the controller is placed on one of i)
2 the top exterior surface of the housing, and ii) a bottom exterior surface of the
3 housing.

1 36. A method of packaging a sensor assembly comprising:
2 providing a package;
3 disposing a housing in the package;
4 disposing a sensor module within the housing wherein its sensor module
5 includes a plurality of sensor packages, each sensor package having an axis
6 of sensitivity in a different special direction;
7 disposing a controller on the housing; and
8 coupling the controller to the sensor module with an electrical coupling.

1 37. The method of claim 36, wherein disposing the controller further comprises:
2 dispensing an adhesive on the housing;
3 placing the controller onto the adhesive;
4 curing the adhesive;
5 wire-bonding the controller to the housing;

6 encapsulating the controller and the wire bonds with an encapsulant; and
7 curing the encapsulant.

1 38. The method of claim 36, wherein the sensor module includes a micro-
2 machined accelerometer.

39. The method of claim 36, wherein the controller includes a
plurality of controller bond pads and the housing includes a plurality of bond
pads;
wherein wire-bonding the controller to the housing comprises;
soldering a plurality of wires to corresponding controller bond pads; and
soldering a corresponding end of the wires to corresponding housing bond
pads.

40. The method of claim 36, wherein the housing includes:
a cavity;
one or more planar surfaces; a top surface;
a bottom surface; and
one or more housing bond pads on the planar surfaces;
wherein the cavity is for receiving the sensor module;
wherein the planar surfaces are for coupling the sensor module, and the
controller to the housing; and
wherein the housing bond pads are for coupling the planar surfaces to the
controller.

41. The method of claim 40, wherein the housing cavity further includes
one or more resilient couplings for resiliently coupling the sensor to the cavity.